Feature

Valuing Nature

After decades of environmentalist campaigning, businesses still pollute and destroy the natural environment because these 'externalities' don't enter their balance sheets. Now politicians, NGOs, academics and business leaders are coming together to save what remains of the natural environment by working out just how valuable it is for us. **Michael Gross** reports.

Nature conservation work has come a long way in just over a century. In the 19th century, species were grouped into useful and harmful ones. Protection, which was beginning to be enshrined in laws and international treaties, was only extended to the useful species. Nuisances such as lions and bears were unflinchingly earmarked for destruction.

Since the foundation of the International Union for the Protection of Nature (IUPN, later IUCN) in 1948, there has been a growing buzz of international conferences and treaties that have increasingly acknowledged the importance of the biosphere with all its biodiversity. UNESCO set up world heritage sites of nature such as the Galapagos Islands (Curr. Biol. *20*, R656), and IUCN regularly updated its Red List of endangered species.

"There is no shortage of agreements," said OECD environment director Simon Upton at the recent World Forum for Enterprise and the Environment, "but what we need to target is the compliance." Upton counted 1,045 international agreements since the 19th century, and yet countries around the world are still feeding their economic growth with an ever-increasing use of fossil fuels and degradation of natural resources.

So what is to be done? If words can't stop the apocalypse, maybe numbers can?

Crunching numbers

The buzzwords 'ecosystem services' encapsulate the idea that wild nature can add value to business activities. For instance, South American rainforests act as a continental water pump providing irrigation to the grazing lands of Argentinian cattle farmers. Cutting down the rainforest would — among many other problems — force the cattle industry to use mechanical irrigation, at a cost that can easily be calculated.

Environmentalists hope that they can steer businesses towards more sustainable practices by quantifying the value that natural resources add

Green lungs: Forests are valuable because they produce the oxygen that we breathe. This photo by Guy Carpenter is one of the winning entries in a competition on the topic 'What do you most value in nature' organised by the *Guardian* newspaper ahead of the World Forum for Enterprise and the Environment in June.

Green spirit: Pavan Sukhdev, who chaired the pioneering TEEB study, in discussion with participants of the WFEE meeting.

both to society and to their bottom line. Encouragingly, several projects have already established the crucial dialogue between science, politics, and business about how best to assess and appreciate the value of nature.

In 2008–10 the United Nations Environment Programme (UNEP) hosted a pioneering study, The Economics of Environment and Biodiversity (TEEB), commissioned by the environment ministers of the G8+5 countries and chaired by Pavan Sukhdev (Curr. Biol. *20*, R217). The study came to the conclusion that if the world continues in its unsustainable ways, by 2050 the costs of biodiversity loss will dwarf today's financial crisis. Conversely, if businesses start taking the value of nature into account, they may find that paying for wildlife conservation now could turn out a very attractive investment for the future.

In its final 'synthesis report' (official title: 'Mainstreaming the Economics of Nature: A synthesis of the approach, conclusions and recommendations of TEEB'), which was released at the Nagoya conference in October 2010, TEEB explains the valuation of nature using three scenarios: a natural ecosystem (forests), a human settlement (city), and a business sector (mining). With these examples, the report aims to illustrate how the economic concepts and tools described in the TEEB reports can help equip society with the means to incorporate the values of nature into decision-making at all levels. All TEEB documents are available at www.teebweb.org.

"TEEB has documented not only the multi-trillion dollar importance to the global economy of the natural world, but the kinds of policy-shifts and smart market mechanisms that can embed fresh thinking in a world beset by a rising raft of multiple challenges. The good news is that many communities and countries are already seeing the potential of incorporating the value of nature into decision-making," Sukhdev said at the launch of the TEEB report at Nagoya.

In a separate effort, the World Business Council for Sustainable Development, representing a membership of around 200 companies with a total revenue of seven trillion dollars, has developed a 'Guide to Corporate Ecosystem Valuation' aiming to help businesses of all shapes and sizes to "improve their decision making" and become more sustainable by accounting for the environmental costs of their activities. So far, over a dozen companies have road-tested a prototype version of the guide to feed back their experiences. The mechanisms outlined in the guide cover a wide range of scenarios. For instance, of the two examples used throughout the central part of the process, involving the valuation as such, one involves water use and land management options at a site used for conservation, agriculture, and recreation, which is managed by the French company Veolia Environnement. The company used the results of the evaluation in its negotiations with local stakeholders concerning the future use of the site.

The other example, from Japanese manufacturer Hitachi, involves the carbon emissions from the production of electronic equipment including computers, digital cameras, and mobile phones. As Japan is not yet involved in carbon trading schemes, the carbon emissions remain externalities for Hitachi that cannot be directly monetised. However, the company anticipates that this situation may change soon, and it also hopes to benefit from an image boost after making its production more sustainable.

Coming together

Although it remains to be seen how much of an effect these new tools will have on the realities of ecosystem degradation and climate change, the focus on evaluation has already achieved one very significant success. It has brought together economists, ecologists, and political leaders in the joint effort to use financial tools to make businesses more sustainable. Compared with the traditional modus operandi where environmentalists and businesses would lobby politicians to turn things their way, this already appears like a more constructive and promising approach.

This new community spirit was in abundant supply at the end of June at the annual World Forum for Enterprise and the Environment, held at Merton College, Oxford. Representatives from academia, business, NGOs and governments engaged in lively and constructive debates, following the brief not to dwell on the widely known problems, but to find novel ways of overcoming barriers and moving towards solutions.

Ecologists like Oxford's David Macdonald gave accounts of current threats to biodiversity and the difficulties faced by traditional protection measures, such as national parks and marine protected areas. Macdonald explained how specific financial schemes such as PECs (payments to encourage coexistence), which are used in Botswana to help farmers get on with the local lions, must be designed to be efficient.

Macdonald spoke in support of the idea of assigning financial value to ecosystem resources and services, but he also cautioned that these values are highly context-dependent. Biotopes fragmented into too small parts are no biotopes at all. Using the example of riverbank habitats for England's water voles, Macdonald showed that the UK taxpayer would be prepared to support this with £12 per metre. While one metre of vole-friendly bank would be no use to man or beast, adding metres to a viable existing habitat may be worthwhile.

Most of the threatened biodiversity, however, does not reside on the banks of the Thames, but more likely on the Amazon or other tropical rivers, where the understandable desire for economic development, often combined with political unrest, make conservation even more challenging.

Waving the flag for the country that hosts the largest number of species per square kilometre, Sandra Bessudo, environment adviser to the president of

Colombia, outlined the challenges that her country faces in trying to protect its natural wealth. Bessudo represented Colombia at the COP10 biodiversity meeting in Nagoya and Colombia was the first country to ratify the resulting agreement.

Currently, Bessudo said, 12% of Colombia's land surface and 1% of its ocean waters is in protected areas, but the official goal is to increase these figures to 17% and 10% by 2020. The country also plans to engage with REDD+ schemes (REDD stands for Reducing Emissions from Deforestation and forest Degradation, and the plus sign indicates additional features including conservation and sustainable management) following its neighbour Ecuador (see Curr. Biol. *20*, R217) and is hosting a pilot scheme for ecosystem valuation run by the World Bank.

Regarding the interactions between governments and the private sector, Bessudo said her government aims to emphasize responsible investment and to regulate the extractive industries more stringently.

Summarising the meeting, Laurent Mermet, a professor of environmental management at Paris, emphasized that the fronts were no longer between enterprise, NGOs, governments, and academia. "All solutions need to engage all four of these together," he said. He also reiterated the observation that nature is often most vulnerable in places where social and political conflict are rife, which makes concerted solutions necessary. "Solutions for inequality need to be in synergy with solutions for biodiversity," Mermet concluded.

No more fish in the sea

One important conservation issue that was underrepresented at the WFEE is the critical situation of the oceans. Host David King, director of the Smith School for Enterprise and the Environment, explained this with a lack of clearly assigned responsibilities. There is no 'President of the Oceans' whom he could invite to such meetings, King quipped. One breakout group at the meeting addressed the marine conservation problems, invoking a deity to step in for the absent president. In a 'Project Neptune' assignment, participants were asked to formulate their plans if they were to rule the Seven Seas. Of the two major problems the oceans face, one, acidification, is land-based as it is a direct consequence of carbon dioxide emissions. Thus it needs to be addressed jointly with climate change. Specifically, it presents a strong argument for addressing climate change at the source, by reducing carbon dioxide emissions, and not in a secondary way (e.g. by reflecting sunlight more efficiently), as only the former would help the oceans.

The second problem the oceans face is a clear example of the economic value of conservation. Carrying on with 'business as usual', the highly subsidised, highly industrialised international fishing trade will have cleared the oceans of edible fish before 2050. As Adriana Fabra from the Pew Trust explained to the group, "industrial fishing is the top threat to the marine environment". While regulatory frameworks are in place they don't seem to work, as illegal, unreported, and unregulated activities continue.

The ongoing destruction of the world's fish stocks is a mindboggling example of how our supposedly intelligent species cuts off the branch it is sitting on. In just a few decades, this industry will have killed off not just the marine environment but also its own source of income, and it is likely to trigger a global food crisis in the process.

Investing in Marine Protected Areas (MPAs), on the other hand, can make perfect business sense. Figures quoted in the TEEB reports show that, if 20–30% of the ocean surface were protected, fish spilling over from these MPAs could sustain a fisheries industry worth $70–80 billion per year. Such benefits can already be seen on a smaller scale in the areas surrounding existing MPAs, where the highest catch rates are observed immediately adjacent to the protected area.

However, it is important that such protective measures are arranged in agreement with the people concerned, not against them. Considering the vast areas that would need to be protected, enforcing unpopular measures would be impossible. Clearly, subsidies and excess capacity will have to be removed, and it is to be hoped that the industry understands the value of the natural resource it depends on before it is too late.

Mother Nature calls

Still, the new coalition of environmentalists and businesses may come under attack from both sides. As David King said in his closing remarks, "there are those who would call us tree-huggers and regard climate science as a socialist conspiracy". Such views may well tip US elections and create additional road blocks on the way to a sustainable economy. On the environmentalist side, there are fears that corporations will tweak numbers to get whatever result they want, such that valuing natural resources may not lead to their protection in the end. "The National Ecosystem Assessment hands the biosphere on a plate to the construction industry," wrote *Guardian* columnist George Monbiot in June.

There is also the risk that, once companies have recognised the value of natural resources, they will find new ways of charging consumers for access to them. The TEEB initiative organised a film competition on the topic 'Why Nature is so precious to me' to advertise the valuation of ecosystem services. In one of the winning entries, 'The invoice', a Mother Nature character comes knocking on a man's door to charge for ecosystem services, including the views of the Grand Canyon and the oxygen that he has used. Although this was clearly meant as a jokey way of making people aware of the value of nature, one could also read this clip as a gloomy forewarning of a future where we actually will have to pay bills for the oxygen we breathe.

Natural wealth: Sandra Bessudo, speaking for the presidency of Colombia, the country with the highest number of species per surface area.

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